

## Rickettsial Disease

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### Introduction

Rickettsial diseases are a group of infections caused by Gram negative bacteria of the genus *Rickettsia* species. They are zoonotic infections that cause typhus and spotted fevers.

Most rickettsial spotted fevers are transmitted to humans by ticks; typhus can be transmitted by different vectors depending on the species of *Rickettsia*, most are transmitted to humans by ticks. The exceptions are endemic (murine) typhus (*R. typhi*) which is transmitted by rat fleas, epidemic typhus (*R. prowazekii*) which is transmitted by the human body louse *Pediculus humanus corporis*, and scrub typhus (*R. prowazekiitsutsugamushi*) which is transmitted by trombiculid mites. These last three diseases are seen more commonly in conditions of poverty and crowding and are rare causes of illness in travellers.

Those that have particular significance to travellers are African tick bite fever (*R. africae*), boutonneuse fever (*R. coronii*) and Rocky Mountain spotted fever (*R. rickettsii*), each of which is part of the spotted fever group of rickettsial diseases.

### Epidemiology

(Data from the [Travel Health Surveillance Section](#) of the Health Protection Agency Communicable Disease Surveillance Centre)

#### Global epidemiology

#### Rickettsial Disease Risk in UK Travellers

## Risk for Travellers

The exact risk of rickettsial disease in travellers is difficult to determine as many infections are under-reported. However, of those that are recognised, African tick bite fever and boutonneuse fever are the most frequently reported.

Ticks that carry rickettsial diseases will inhabit forested, brush or grassy areas and can drop or be brushed onto clothing of passing humans. Travellers on walking or hunting safaris who go through brush and grasslands of southern Africa in particular, are therefore at increased risk of acquiring African tick bite fever.

## Transmission

Most types of rickettsial disease are transmitted by several genera of ticks or other arthropods, which take up the bacteria whilst feeding on infected animals. Reservoirs for African tick-bite fever include cattle, hippopotamus and rhinoceros. The bacteria are found in the salivary glands of the tick and are transmitted while the tick takes a blood meal.

## Signs and Symptoms

The spotted fever group of rickettsial diseases are clinically similar. After inoculation from a bite, a febrile illness develops following a short incubation period of a few days that may persist for up to two weeks if untreated.

An eschar (tache noir) typically develops at the site of the tick bite in boutonneuse fever. This resembles a small ulcer, is between two and five centimetres in diameter, and has a black, necrotic centre. On the fourth or fifth day of illness, a generalised rash develops involving the palms and soles of the feet.

In African tick bite fever, multiple eschars may be present, but the generalised rash is frequently absent. Lymphadenopathy in the region of the bite and oedema are more common symptoms.

Rocky Mountain spotted fever can cause malaise, myalgia, headache and chills in addition to the characteristic maculopapular rash involving the palms and soles of the feet. It is generally a more severe illness with multiple organ involvement.

The case fatality rate of African tick bite fever and boutonneuse fever are low even without antibiotics. However, the fatality rate of Rocky Mountain spotted fever can be as high as 25% if untreated. With prompt diagnosis and treatment death is uncommon, but is more likely if treatment is delayed or if patients are over 40 years of age.

## Treatment

The laboratory diagnosis of rickettsial disease can be confirmed by serology, antigen detection, or PCR usually after one or two weeks of onset of illness. Diagnosis is therefore usually based on clinical signs and symptoms following travel to a risk area, and confirmed once treatment has commenced. Many travellers will not recall a tick bite.

Rickettsial disease responds to antibiotic therapy, with doxycycline being the drug of choice.

## Prevention

There is no vaccine for rickettsial disease.

Travellers should be encouraged to practice [insect bite avoidance](#). Six to ten hours of feeding are required by the tick before rickettsia bacteria begin to be inoculated into the human host. Travellers should inspect themselves regularly for ticks and remove them promptly.

Pets should also be inspected for ticks before allowing them to enter the home.

## Reading List

Chin J (Ed) Control of communicable diseases manual 17<sup>th</sup> edition. 2000 American Public Health Association

Walker DH. Rickettsial disease in travellers. Trav Med Inf Dis. 2003; 1: 35-40

Jensenius M, Fournier PE, Kelly P, et al. African tick bite fever. Lancet Infect Dis 2003;3:557-564